MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 2, 2022/2023**

## DSN5201 – DATA COMMUNICATIONS AND NETWORKING

( All sections / Groups )

14 JULY 2023
9.00 a.m – 11.00 a.m
(2 Hours )

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**INSTRUCTIONS TO STUDENTS**

1. This Question paper consists of 2 pages with 4 Questions only.
2. Answer **ALL** questions. The distribution of the marks for each question is given.
3. Please write all your answers in the Answer Booklet provided.

## Structured Questions [40 marks]

*Instruction: Write your answers in the **Answer Booklet.***

### Question 1

a) There are three different mode of communications (dataflow). With the aid of a diagram, explain the three different mode. (3 marks)

b) A light wave with a frequency of 5.2 x $10^{14}$ Hz lies in the air. Calculate the wavelength of the light given that the propagation speed of the light is 3.00 x $10^{8}$ $ms^{-1}$. Convert your answer in units of *nm*. (3 marks)

c) Draw a digital signal of a data stream 01110010 with NRZ-I encoding and Manchester encoding.

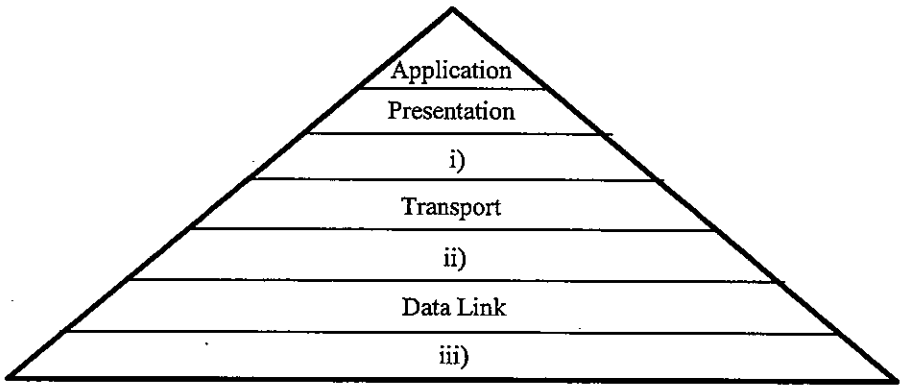
(4 marks)

**[TOTAL 10 MARKS]**

### Question 2

a) What are the differences between ASK, PSK and FSK? (1.5 marks)

b) Referring to the OSI model. Fill in the blanks for i), ii) and iii) with the correct layers. (1.5 marks)




c) Draw the sine wave with the following requirements: (3 marks)

i) Peak Amplitude: 10V
ii) Frequency: 2
iii) Phase: 270°, phase shift to 90°

d) Given that an analog signal has a bit rate of 7000bps and a baud rate of 1000 baud. Calculate the following questions by showing the working steps.

i) How many bits can be carried by each signal element? (2 marks)
ii) How many signal elements needed? (2 marks)

**[TOTAL 10 MARKS]**

**Continued .....**

## Question 3

a) Draw the TDM frames showing the character data, given the following information: (4 marks)

Four signal sources
- Source 1 message: D
- Source 2 message: C O M M
- Source 3 message: A
- Source 4 message: N E T

b) Assuming in a certain CRC system, the generator polynomial is given by :-

$$x^3 + x + 1$$

and the received message block is 110011010. Determine whether the received message block is corrupted. (3 marks)

c) A sender sends a block of information bits as follow.

**10110110 01110011 00111001 11110011 00000100**

Use two-dimensional parity is used, show the complete block of information that will be received by the receiver. (3 marks)

**[TOTAL 10 MARKS]**

## Question 4

a) One of the responsibility of the data link layer is error control. Explain two types of error that will be managed by the data link layer. (2 marks)

b) Describe two differences between Polling and Token Passing controlled-access method. (4 marks)

c) Define the type of address (unicast or multicast) for the following Ethernet address: (2 marks)

i) 09:43:5C:64:18:10
ii) 5B:2E:30:11:7B:11

d) List and explain two advantages of wireless LAN. (2 marks)

**[TOTAL 10 MARKS]**

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